



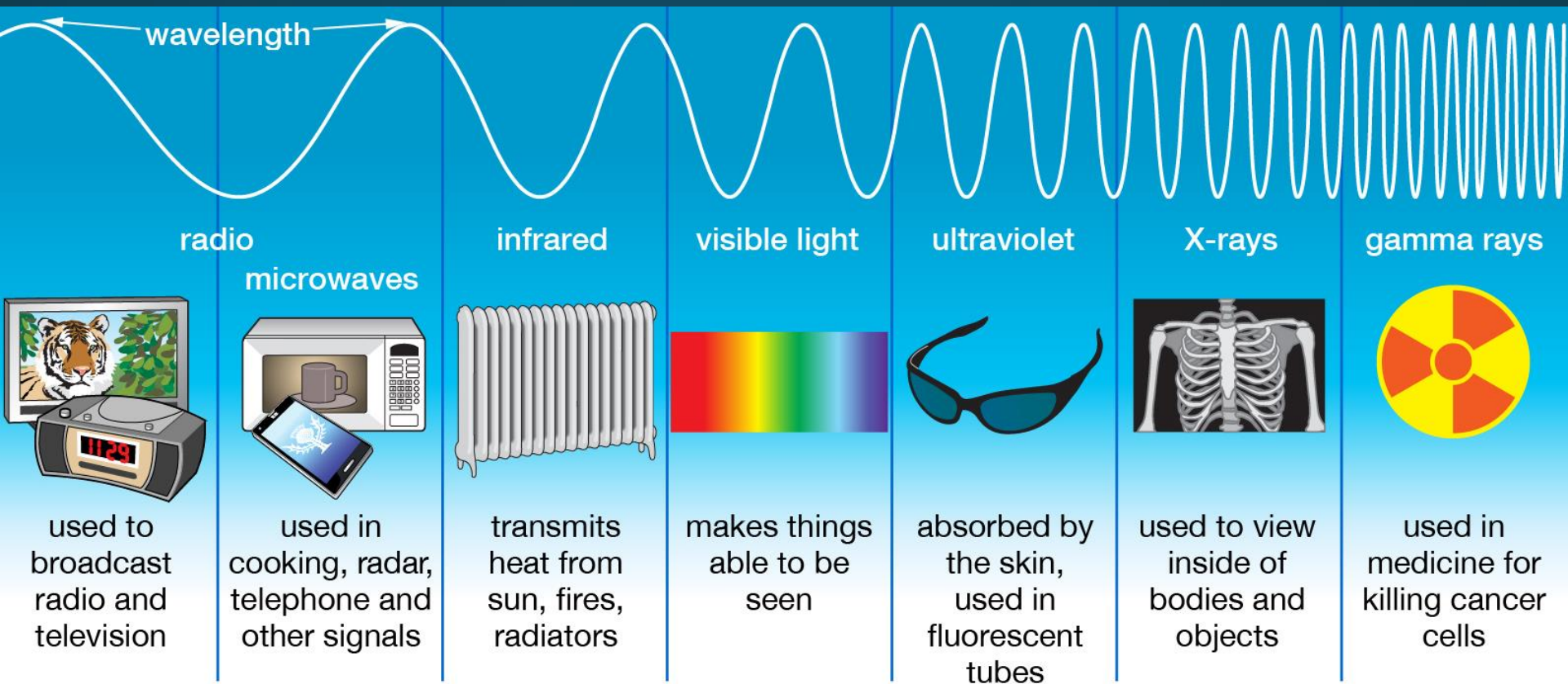
# Observing the Earth from Space

Michael Abrams and Tom Nolan  
California Institute of Technology/Jet Propulsion Laboratory  
Pasadena, CA

Rebecca Abrams  
Novato Unified School District  
Novato, CA

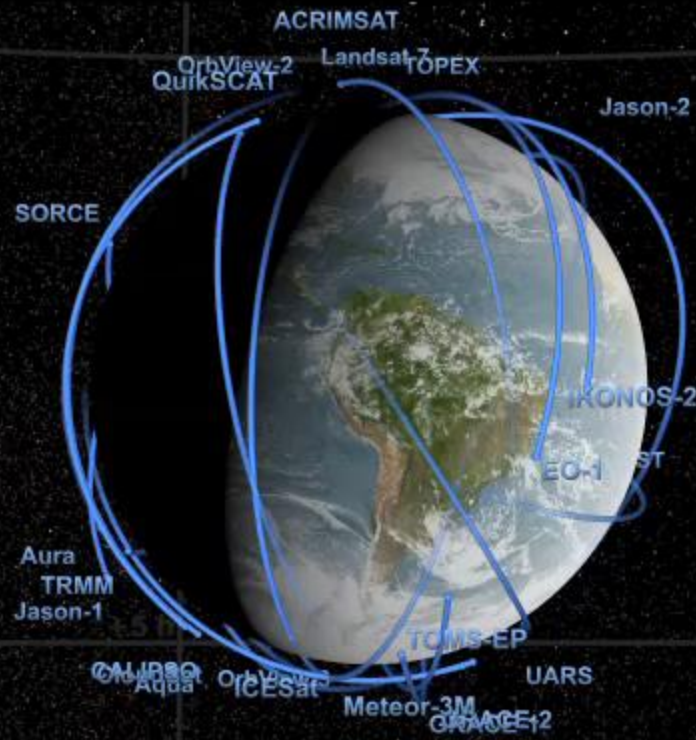


# The Electromagnetic Spectrum



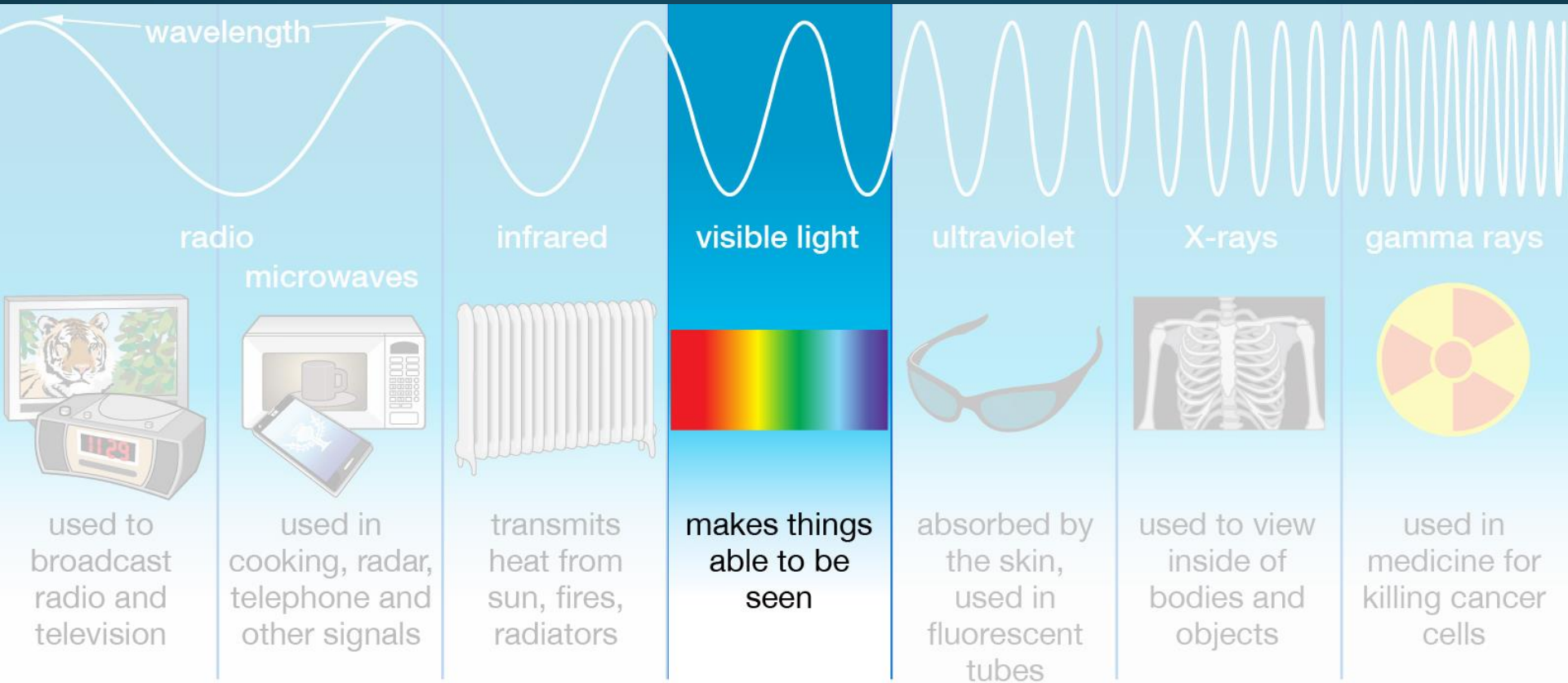


# NASA's Earth Observing Satellites





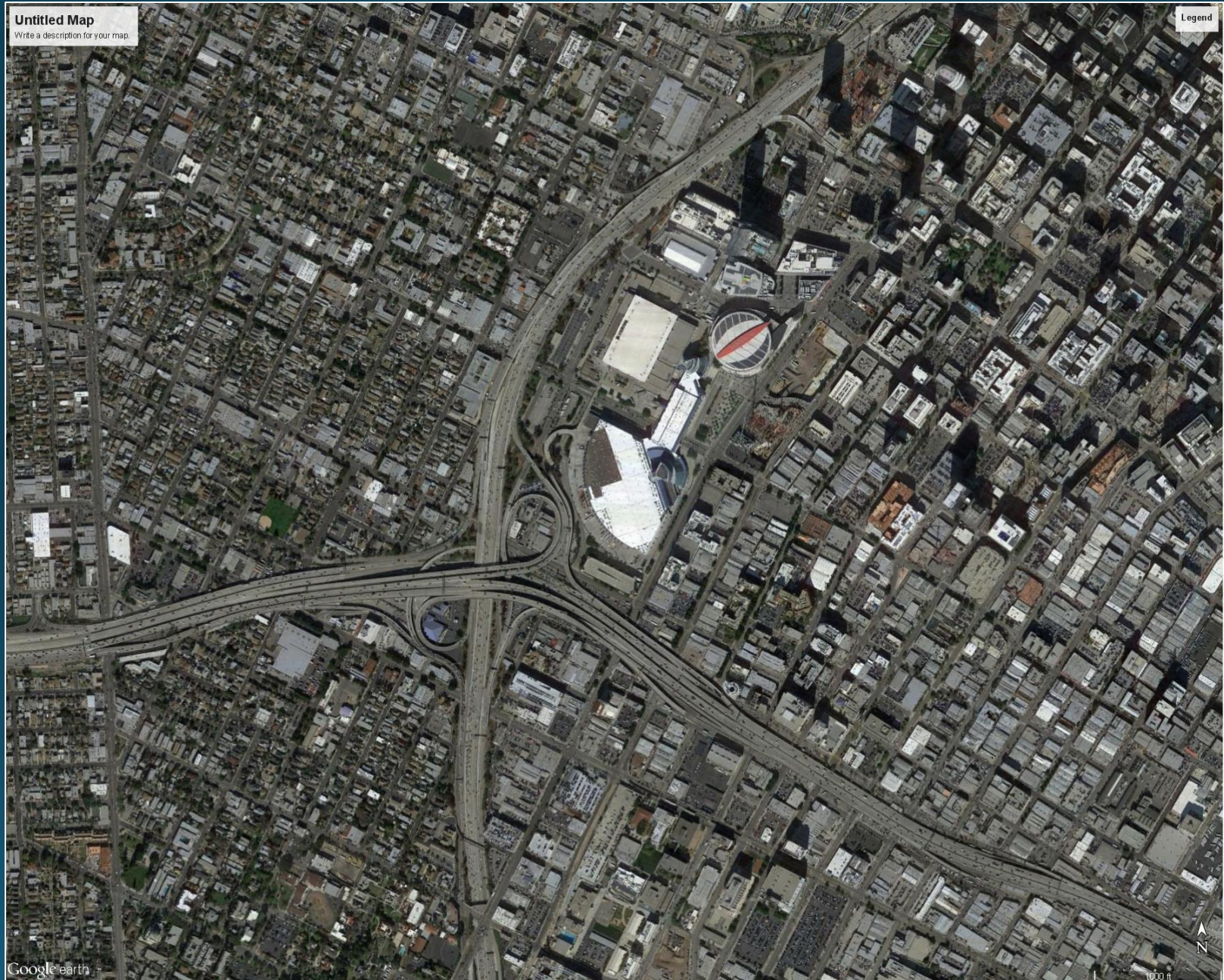
# The Electromagnetic Spectrum--Visible







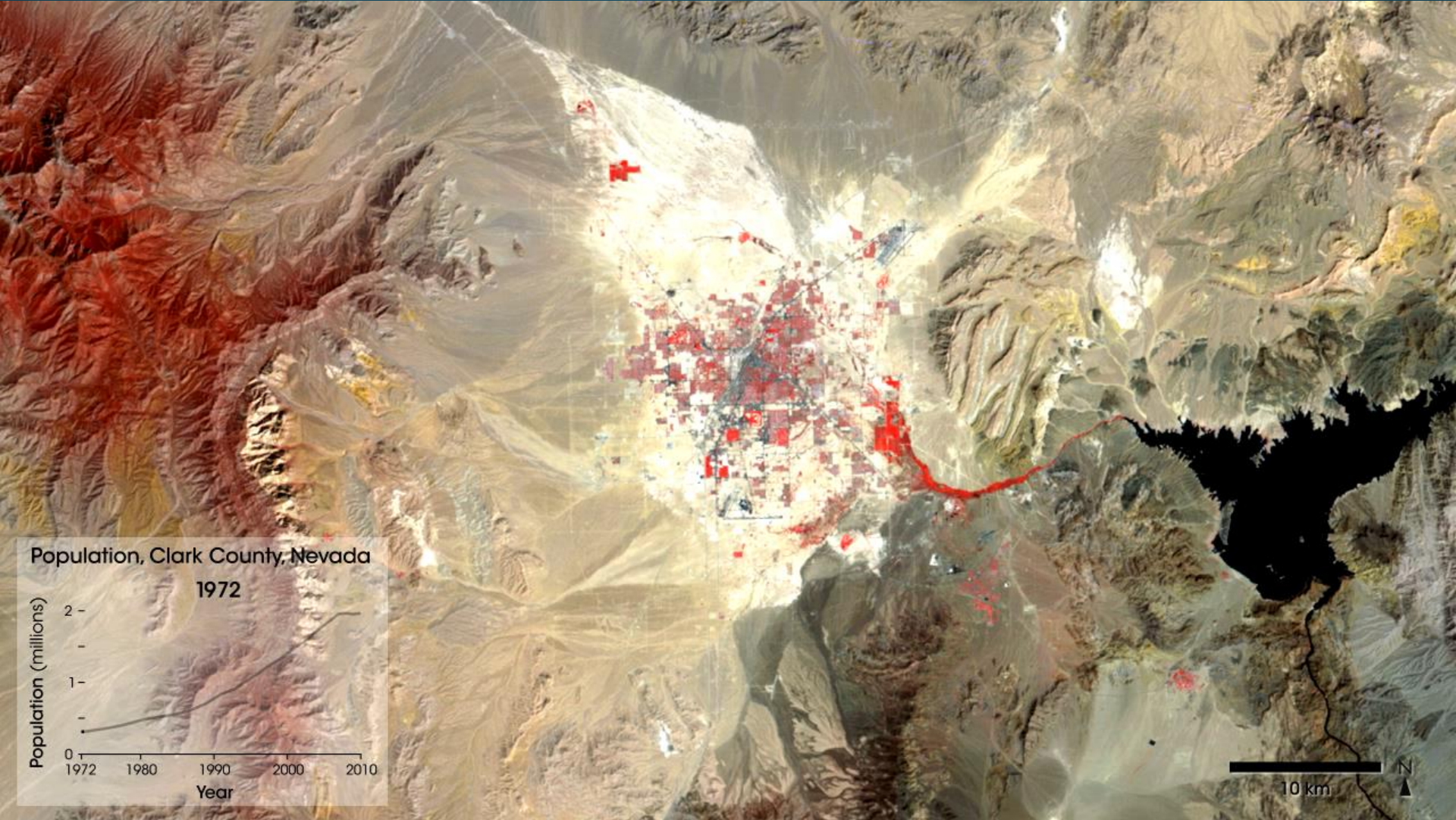
# Visible Image: Google Earth







# Growth of Las Vegas







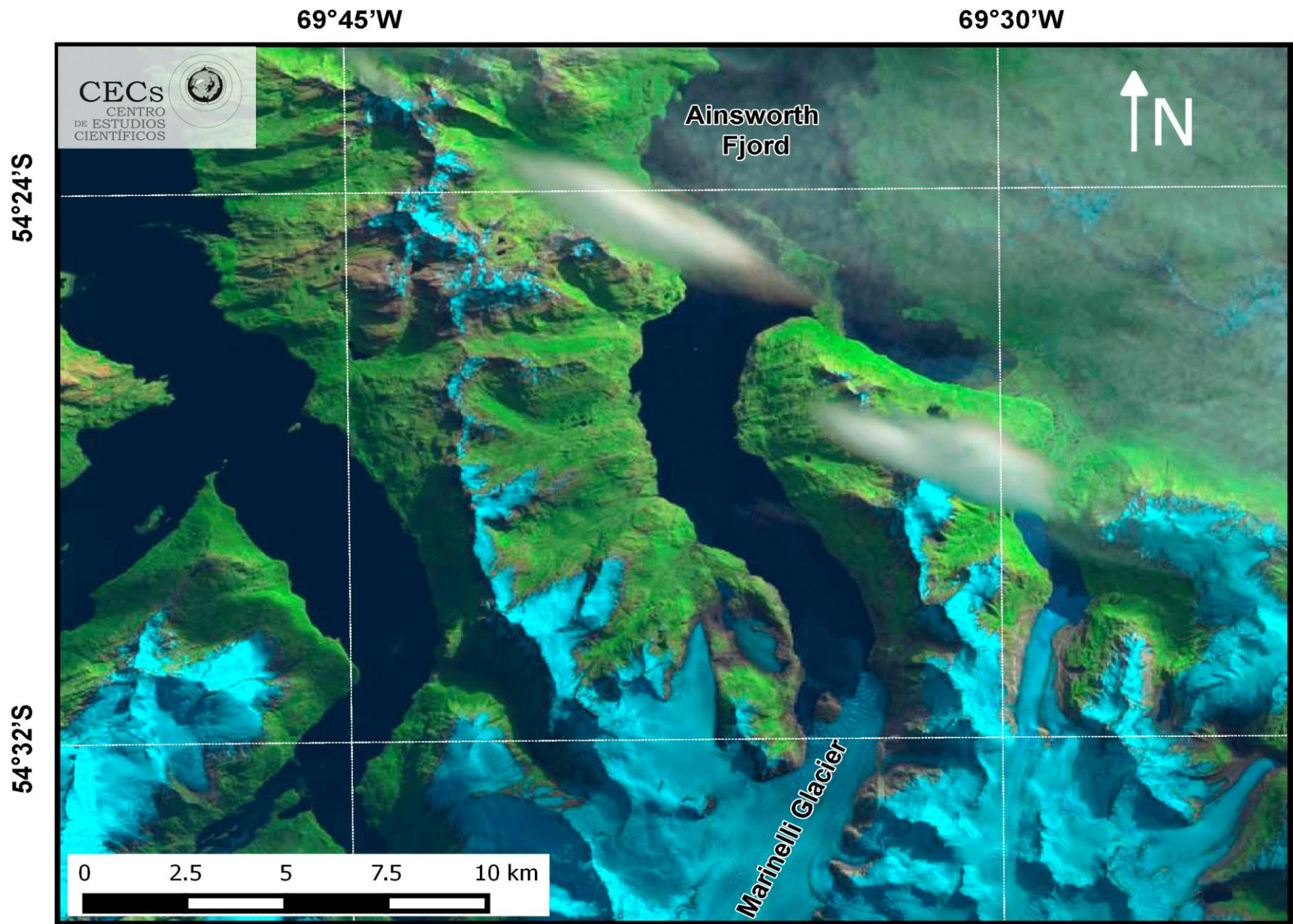
# Deforestation in Brazil Amazon

1975





# Monitoring Glacier Retreat





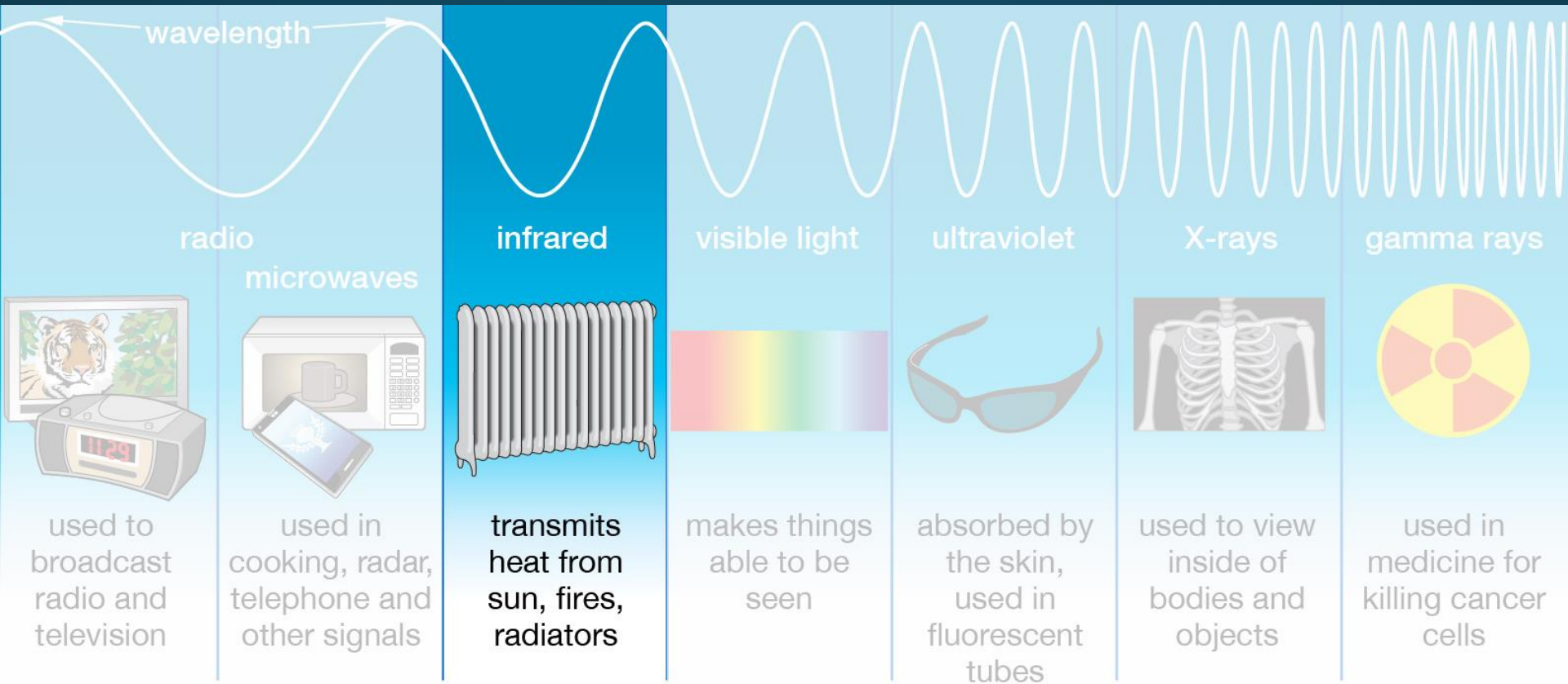


# Earth Night Lights





# The Electromagnetic Spectrum—Thermal Infrared







# Thermal Infrared ("Temperature")





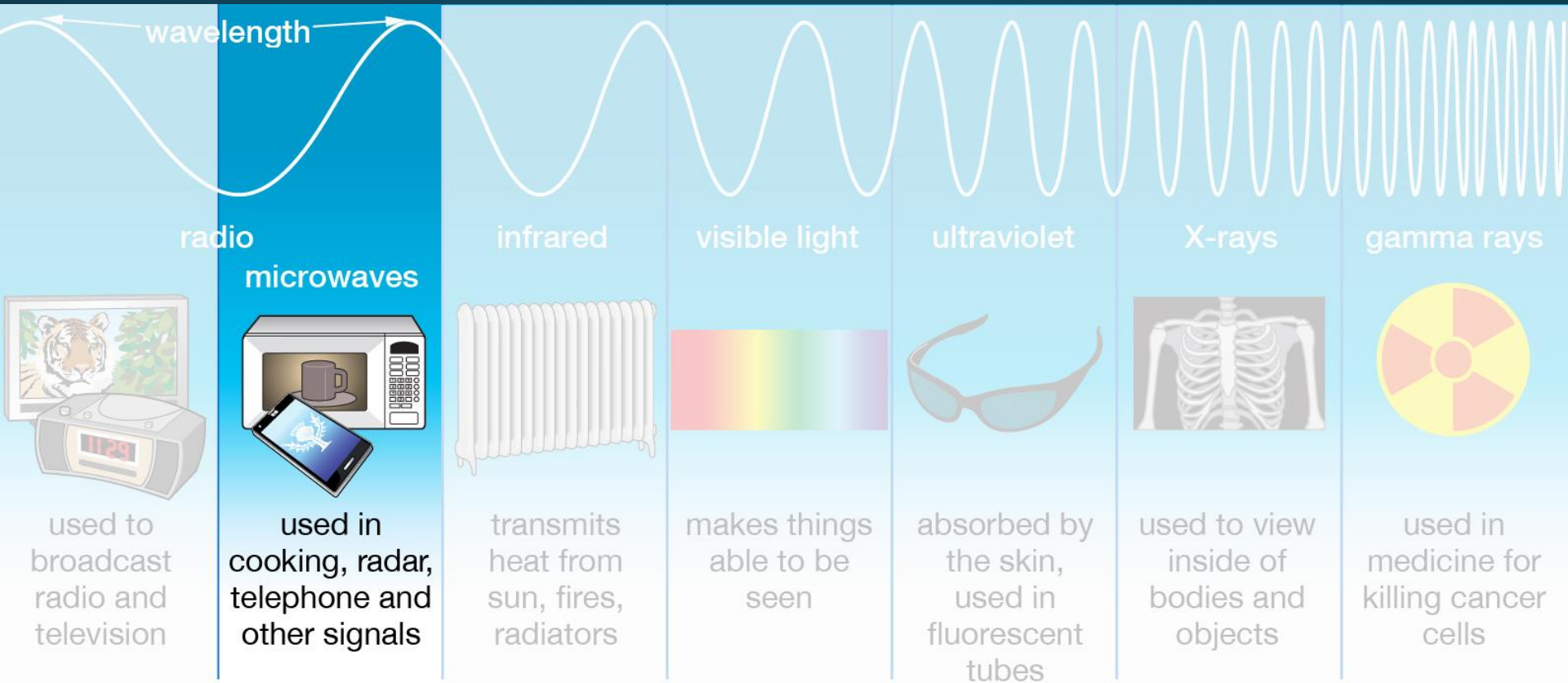
# Global Fire Distribution







# The Electromagnetic Spectrum--Microwave





# Microwaves -- RADAR



Excite water molecules



Speed using Doppler shift

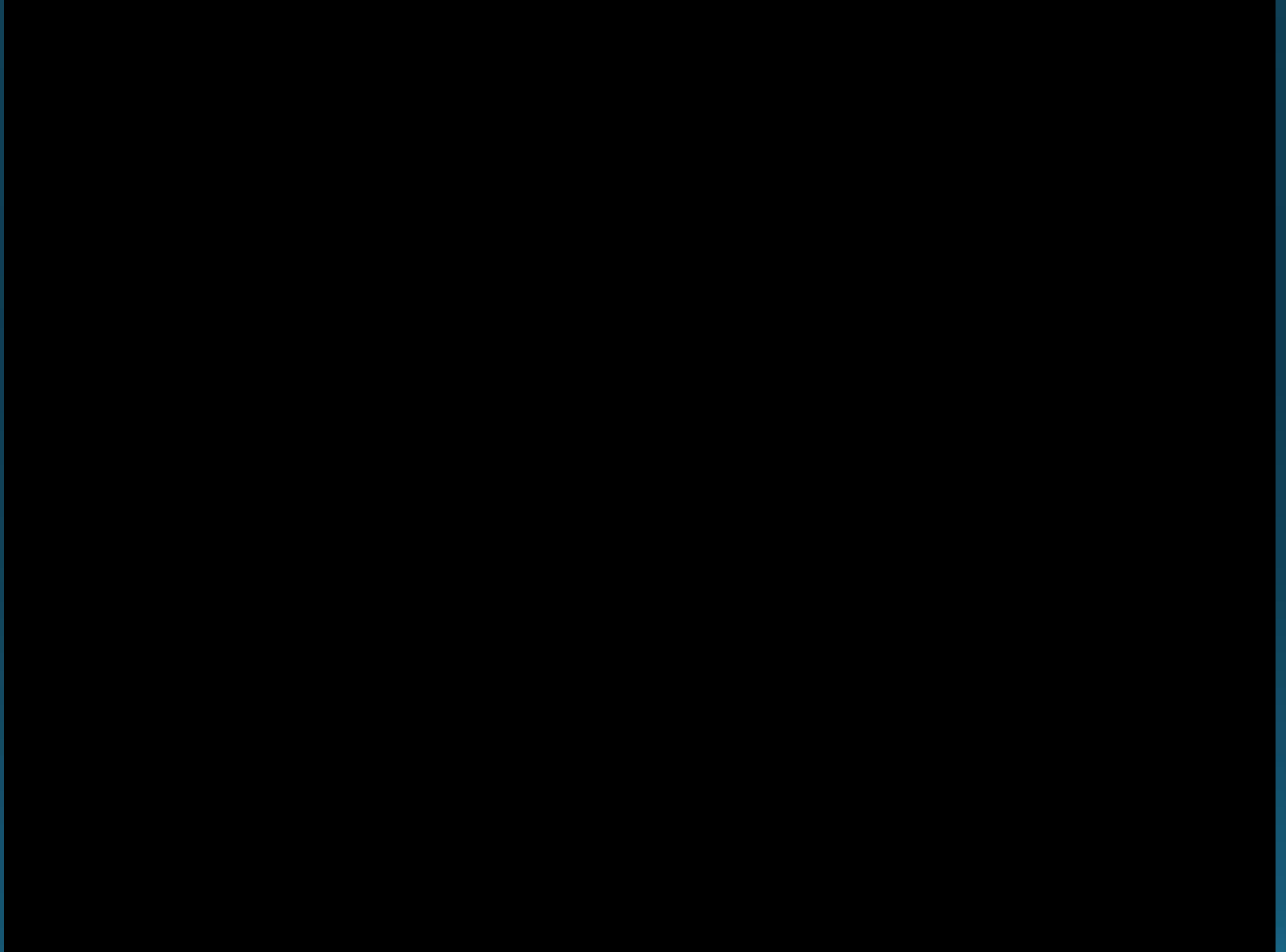


Distance of rain





# Global Precipitation





# Land Subsidence from Groundwater Pumping







# El Niño: Height from microwaves

